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monkeys began to surpass the power of receiving impressions which existed in other animals, he would be most liable to conceive great dread of that enemy which inflicted upon him wounds of a very different sort from those which he received from his own kind or from animals which approached more or less to his own form, and which also produced effects so subtle in their character and operation, that they would be apt to leave lasting impressions on those animals which were frequently subjected to witnessing them. It should be remembered, also, that the home of the monkey and the spot where, in all probability, the earlier *Primates* first saw the light, is in those regions of the earth which are most infested by numerous and venomous serpents.

These facts will at once suggest to all who put their faith in the theory of gradual development, that the fear of the serpent became instinctive in some far distant progenitor of man, by reason of his long exposure to danger and death in a horrible form, from its bite, and that it has been handed down through the diverging lines of descent which find their expression to-day in *Homo* and *Pithecius*. How strongly marked it is in the latter, the experiment detailed above, corresponding in each of its results with that of Mr. Darwin, bears testimony; and for the evidence of its influence on the mind of the former, turn to the story of the serpent in Paradise; to the signs and symbols of many ancient mythologies, and to the feeling which few men can deny to themselves when they are brought into association with even the most beautiful and harmless member of the order *Ophidia*.

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## TRACES OF SOLAR WORSHIP IN NORTH AMERICA.

BY EDWIN A. BARBER.

In an article published in the October NATURALIST, entitled "On the Ancient and Modern Pueblo Tribes of the Pacific Slope of the United States," the writer made use of the following expression: "Both paid homage to the sun, or at least looked for a Messiah daily to come to them from the east," to which assertion exceptions have been taken by some ethnologists.

It is held by this class of scientists that the heavenly bodies were never deified by any of the American races. Granting this to be, in some degree, true: That the luminaries, collectively

or individually, were not elevated to the *highest* place in their worship, by any tribe or people in North America, yet the celestial orbs, nevertheless, figured prominently in the list of supreme objects of worship, and many *traces*, at least, of this form of worship are found in the religions of aboriginal races of all ages, from the oldest American people down to the tribes of the present day, especially among those versed in astrology or astronomy.

Although little is known of the Toltecs of Ancient Mexico, it is an established fact that astral worship existed among them. They paid homage to the sun and dedicated their earliest temples to him. The moon, also, they revered as his wife and the stars were believed to be his sisters, according to the Mexican Licentiate, Don Mariano Veytia, in his "*Historia Antigua*." The same writer describes the ruins of San Juan Teotihuacan, the most ancient architectural remains of Mexico, situated about thirteen miles north-east of the capital city. Of these, the largest pyramid, which measured six hundred and eighty feet in length at the base and was estimated at two hundred and twenty feet in height, was dedicated to Tonatinh or Tonatricli, the sun; the next structure in size and importance was inscribed to Meztli, the moon. On the summit of the former a temple was erected, in which was placed an immense statue representing the sun, which faced toward the east.

According to the accounts of Bernardino de Sahagun, a Spanish writer of the sixteenth century, and one who was particularly cautious in his deductions and entirely reliable in his accounts of the religion of the Aztecs, as set forth in his "*Historia Universal de Nueva España*," solar and lunar worship occurred in the Aztec religion, the sun with them being a spiritual conception. They believed that the heroes who fell in battle or died in captivity, or women who died in childbirth, were immediately transported into the House of the Sun, where they led a life of everlasting delight. From the broad tops of their *teocallis* or temples, the Aztec priests were in the habit of performing impressive, and, in too many cases, bloody ceremonies, in which the heavenly bodies were made to take a prominent part.

After the fall of the Mexican Empire, traces of sun worship were common. Captain Fernando Alarcon, in the year 1540, mentioned having met, on the Colorado River, Indians who worshiped the sun.

The same custom exists among the modern Pueblo Indians of New Mexico. Lieut. A. W. Whipple says of these people that "they are now anxiously expecting the arrival of Montezuma; and it is related that in *San Domingo* (one of the nineteen Pueblo towns), every morning at sunrise, a sentinel climbs to his house-top, and looks eastward, to watch for his coming."

Mr. Whipple also gives a tradition<sup>1</sup> of these Indians which assigns *Acoti* (another Pueblo village, situated on the Rio Grande del Norte, the ancient Tiguex) as his birth-place; but the tale is so at variance with facts and so rich in imagination that it is evidently the invention of some fertile brain. The Spaniards who came among the Pueblos, just after the Mexican conquest, about the year 1539, evidently introduced the name of Montezuma and probably instilled into their minds this idea of his second advent. Thus the worship of heavenly bodies may have become blended with the deification of ancestors; then the sun may have taken the name of Montezuma. Whipple further states that they "smoke to the sun that he may send them antelope to kill, Indians to trade with, and save them from enemies."

Among the Navajos, also, by the same authority, "The sun, moon and stars are sacred, as the authors of seasons of rain and of harvest." He also says of the Zufians, "Beneath the apparent multiplicity of gods, these Indians have a firm faith in the Deity, the unseen Spirit of God. His name is above all things sacred, and like Jehovah of the Jews, too holy to be spoken. Montezuma is His son and their king. The sun, moon and stars are His works, worthy of their adoration."

The "ancient Pueblos" of the Pacific slope of the United States, whose ruined stone structures are found so numerously throughout portions of Colorado, Utah, New Mexico, Arizona, and probably Nevada, held the sun in high esteem, at least, if they did not worship it. This is shown in the situation of the houses in many localities. In the Cañon of the Rio Mancos,<sup>2</sup> for example, the dwellings are almost invariably found secreted in the cliffs of the western bluff, and from their roofs the inhabitants were wont to salute the king of day as he raised himself above the eastern plateau.

<sup>1</sup> Vol. III, Pacific R. R. Reports.

<sup>2</sup> A northern tributary of the Rio San Juan, in the extreme south-western corner of Colorado.

Among the Moqui tribe, to-day, traces of this form of worship still obtain. The religion of their forefathers seems to have degenerated into a mere custom, the origin of which has been long lost sight of in their obscure traditions. Thus, in the course of time, it seems probable, the worship of celestial orbs has given place to hero-worship; solar worship to anthropomorphism, and it is said that the Moquis have ultimately become imbued with the belief that it is a Messiah, in the form of one of their own ancestors, that is, Montezuma,<sup>1</sup> whom they are expecting to arrive from the east. The Moquis and the Pueblos and Zuñis are cognate tribes and doubtless remnants of the ancient Nahuatlac races; hence the similarity of their customs.

As the faint streak of red lights up the low horizon, tall, dark figures appear on the parapets of the seven Moqui towns and remain facing the dawn until the sun has appeared entirely to view. Then the muffled forms drop away slowly and sadly, one by one, for another morn has brought disappointment to the souls of many that have watched so eagerly and persistently for the coming of the great Montezuma. The routine of another Moqui day has commenced; all is bustle and life and the subdued hum of household occupation floats out drowsily on the sullen, sultry air and the sound of the hundred flour-mills (*metates*) grinding steadily on every side, seems, as it issues from the doors and windows of the stone houses, to pause in mid-air like a droning bee. Then scores of busy figures repair with their water-vessels to the verge of the steep bluffs, and disappear in the crevices of the rocks below.

Having presented these facts in support of the assumption that solar adoration entered, to some extent, into the religions of some of the American races, we may sum them up briefly as follows:

1. Fetichism being the commonest form of idolatry, especially amongst the lower races of man, most tribes whose religion is polytheistic, venerate the sun.

2. We can detect vestiges of sun-worship in the ruins of the Toltec and Aztec temples and pyramids and also in the statues which were placed within them.

3. We can observe traces of it in the traditions and observances of savage and semi-civilized tribes at the present day.

4. We notice indications of it in the hieroglyphics or picture-

<sup>1</sup> Motecuhzuma.

writings of most North American tribes, ancient and modern, in which the sun symbol occurs frequently.

5. Also in the position of ruined stone houses which look toward the east, the larger rectangular buildings of the Pacific slope being built so as to face the cardinal points.

6. Finally, we can observe signs of this worship in the orientation of dead bodies in graves.

If we accept these briefly stated facts, there can be no reasonable doubt that the worship of the sun entered, to some degree, into the religions of the American aborigines; how far, we have not the means of determining; yet, quoting the poet Southey's words,—

“I marvel not, O sun! that unto thee  
In adoration man should bow the knee,  
And pour the prayer of mingled awe and love;  
For like a god thou art, and on thy way  
Of glory sheddest, with benignant ray,  
Beauty, and life, and joyance from above.”

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## A NEW LOCALITY FOR CORDYLOPHORA.

BY S. F. CLARKE.

THIS interesting form of compound hydroid was first discovered in this country by Prof. Leidy, a number of years ago. It was found living “in a slightly brackish pond near the coast,” in the neighborhood of Newport, Rhode Island. In October, 1870, it was again taken by Prof. Leidy, this time in the Schuylkill river, near Philadelphia. A record of the same will be found in the Proceedings of the Academy of Natural Sciences, Philadelphia, for 1870, page 113, from which we learn that Prof. Leidy had not decided whether his specimens were distinct from *C. lacustris* Allman. He says “It appears however to be much smaller. Allman says the colonies are several inches and the polyps a line in length. Ours are not more than one-half that size. As a variety it might be named *C. americana*.” Unfortunately there are no specimens to refer to and their specific identity must be left undetermined.

On the thirteenth of last October a collecting party of three from the John Hopkins University, consisting of Dr. Brooks, Dr. Uhler and the writer, were so fortunate as to find *Cordylophora lacustris* Allman, living in great abundance within seven or eight miles of Baltimore. The mouth of Curtis' creek, from the point